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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re PATENT APPLICATION of:
STEVEN T. FINK, ET AL.

Confirmation No: 3532

Application No.: 10/705,224

Group Art Unit: 1763

Filed: November 12, 2003

Examiner: Sylvia MacArthur

Title: METHOD AND APPARATUS FOR IMPROVED BAFFLE PLATE

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

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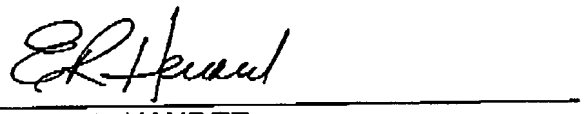
REPLY BRIEF IN RESPONSE TO EXAMINER'S ANSWER OF APRIL 5, 2007

PILLSBURY WINTHROP SHAW PITTMAN LLP



E. R. HERNANDEZ
Reg. No. 47641

Date: May 25, 2007
P.O. Box 10500
McLean, VA 22102
Telephone: (703) 770-7900
Facsimile: (703) 770-7901

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE HONORABLE BOARD OF PATENT APPEALS AND INTERFERENCES

In re PATENT APPLICATION of:

FINK *et al.*

Group Art Unit: 3532

Appln. No.: **10/705,224**

Examiner: MacArthur, Sylvia

Filed: November 12, 2003

Title: METHOD AND APPARATUS FOR IMPROVED BAFFLE PLATE

- REPLY BRIEF UNDER 37 C.F.R. §41.41 -

Mail Stop **Appeal-Patents**
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

The Appellants hereby submit this Reply Brief in response to the Examiner's Answer of April 5, 2007.

I. REPLY ARGUMENT

Appellants simply point out that the Examiner's rejections should be reversed because the applied references simply do not teach each and every claim limitation.

A. Clarifying Remarks

Despite the clear language of the claims and the definitions and descriptions provided by the disclosed embodiments, it is apparent that the Examiner has a fundamental problem understanding the elements and configuration of the claimed subject matter. In an attempt to further clarify the claimed subject matter, Appellants first rely on the described embodiments as well as very basic principles known to those in the art.

The components in the interior of a plasma processing chamber (including the baffle plate) are exposed to active plasma and, over time, are susceptible to erosion. (Specification: page 1, par. [0003]). It is well know to those of ordinary skill, that replacing a baffle plate in conventional plasma chambers requires the disassembly of the components associated with

the substrate holder and baffle plate. Once the new baffle plate is installed, painstaking efforts are taken to ensure that the entire substrate holder and baffle plate assembly are centered within millimeter tolerances so that the outer edge of the baffle plate does not touch or scratch the interior of the plasma chamber wall, as the substrate holder moves up and down within the chamber.

In order to avoid such painstaking efforts, the claimed subject matter is directed to a baffle plate assembly which includes a centering ring that is specifically designed to "automatically center" the baffle plate around the substrate holder by coupling a mating feature on the baffle plate with a centering ring attached to the substrate holder. (Specification: page 8, par. [0040]). For example, as made clear by the disclosed embodiments, the mating feature on baffle plate **64** comprises a mating surface **87** on the inner radial edge **86** (see, FIG. 5) while the centering ring **100** is affixed to the substrate holder. The centering ring **100** comprises a flange region **110**, and a lip region **112**, wherein the lip region **112** further comprises a centering surface **120** (see, FIGs. 6, 7). The mating surface **87** of baffle plate **64** is attached to the centering surface **120** via bolts (or other electrically conductive fasteners). As such, baffle plate **64** is coupled to the portion of the centering ring **100** that extends radially outside the periphery of the substrate holder (*i.e.*, centering surface **120**) and, by virtue of this coupling, baffle plate **64** is automatically centered.

Once the claimed configuration is in place, an eroded or damaged baffle plate **64** may be easily replaced by removing the bolts that hold the mating surface **87** of baffle plate **64** to the centering surface **120**, lifting the eroded baffle plate **64** away, lowering and aligning the mating surface **87** of the new baffle plate **64** to the centering surface **120**, and bolting the new baffle plate **64** in place. In this manner, the painstaking efforts typically taken to ensure that the entire substrate holder and baffle plate assembly are centered within millimeter tolerances are avoided. (Specification: page 8, pars. [0049]-[0050]).

With this said, each of independent claims 1, 16, and 17 positively recite, in one form or another, a ***centering ring*** configured to be coupled to the substrate holder, wherein at least a portion of the centering ring extends radially outside a periphery of the substrate holder, and a ***baffle plate*** comprising one or more passageways, wherein the baffle plate is configured to

be centered within the plasma processing system by coupling the baffle plate to the portion of the centering ring extending radially outside the periphery of the substrate holder.

B. Examiner Rejections Based on Hiroyuki

Straight to the point, there is ***not*** a single mention in Hiroyuki of any type of device that is either specifically configured to center, or is capable of centering, the baffle plate. Hiroyuki merely discloses an insulating ring **13** and a baffle plate **12** positioned beneath the insulating ring **13** between an end face of the electrode protection member **8** and a side face of the electrostatic chuck **4**. (Hiroyuki: par. **[0018]**; FIG. 1).

The Examiner continues to assert that insulating ring **13** corresponds to the claimed centering ring. Such an assertion must fail, as even a casual inspection of FIG. 1 demonstrates that insulating ring **13** sits on top of baffle plate **12** – which means that the insulating ring **13** must be mounted *after* the baffle plate **12** has already been centered and installed. As such, insulating ring **13** cannot, under any circumstance, act or otherwise function as a centering ring.

Accordingly, Appellant respectfully submits that Hiroyuki is incapable of teaching each and every feature of the independent claims. Thus, for these reasons, among others, the Appellant respectfully submits that Hiroyuki cannot be relied upon to anticipate any of the independent claims.

C. Examiner Rejections Based on Tomoyasu et al.

Like Hiroyuki, there is nothing in Tomoyasu et al. that remotely suggests any type of device that is either specifically configured to center, or is capable of centering, the baffle plate. Tomoyasu et al. discloses the use of a ring structure **325**, that has a bent top portion **327** that rests on outer circumference of a susceptor **305** and an integrated baffle plate portion **326**. (Tomoyasu et al.: col. 11, lines 5-19; FIG. 8.). As such, ring **325**, bent top portion **327**, and baffle plate portion **326** comprise an solitary integrated structure.

First, such an integrated ring structure cannot reasonably be construed as corresponding to the ***separately*** claimed "centering ring" and "baffle plate". The claim language on its face makes it clear that these two elements are separate and distinct from each other. Second, the claims require that the baffle plate ***be centered by coupling the baffle plate to*** the portion of ***the centering ring*** that extends radially outside the periphery of the substrate

holder. There is no discussion, whatsoever, of centering the baffle plate in Tomoyasu et al. and any replacement – or centering – of the baffle plate portion **326** necessarily requires the replacement of the entire integrated ring structure **325**, which is antithetical to the spirit and purpose of the claimed invention.

Appellant points out that the Examiner has also taken an unreasonably broad interpretation of the term "coupling." As noted in the remarks above in Section I.A, the thrust of the claimed invention is to be able to install a centering ring that allows a baffle plate to be fastened to it, so that after time, an eroded baffle plate may be easily removed by unfastening the bolts, lifting the eroded baffle plate, lowering and aligning the new baffle plate with the centering ring, and then fastening the new baffle plate to the ring, so that the new baffle plate is automatically centered. In support, the disclosed embodiments repeatedly identify that the "coupling" of the baffle plate to the centering ring is achieved through bolts or other fasteners.

Despite such evidence of what is meant by the term "coupling," the Examiner takes the position that the "integration" of ring **325**, bent top portion **327**, and baffle plate portion **326** into a solitary integrated structure anticipates "coupling". Given the context of the claimed subject matter, such interpretation cannot stand as it flies in the face of the purpose and spirit of the claimed invention.

Accordingly, Appellant respectfully submits that Tomoyasu et al. is incapable of teaching each and every feature of the independent claims. Thus, for these reasons, among others, the Appellant respectfully submits that Tomoyasu et al. cannot be relied upon to anticipate any of the independent claims.

D. Examiner Rejections Based on Li et al.

Once again, like the previous references, Li et al. fails to suggest any type of device that is either specifically configured to center, or is capable of centering, the baffle plate. Li et al. discloses a perforated plasma confinement ring **222** (equivalent to a baffle plate) that is disposed outside of the outer periphery of the bottom electrode **210** such that the perforated plasma confinement ring **222** abuts the focus ring **216**, if the focus ring **216** is present. (Li et al.: col. 5, lines 25-28; FIG. 3). The focus ring **216**, which is optional, is disposed around the outer periphery of the bottom electrode **210**. (Li et al.: col. 5, lines 5-7; FIG. 3). There is

absolutely nothing to suggest that focus ring **216** is a centering ring – to the contrary, the focus ring **216** appears to merely form the housing for bottom electrode **210**.

Equally notable is the fact that FIG. 3 clearly depicts confinement ring **222** to be electrically connected to an external ground. Artisans of ordinary skill will readily appreciate that confinement ring **222** must, therefore, be attached, via electrically conductive fasteners, to the interior wall of the chamber – and ***not*** to the portion of the centering ring that extends radially outside the periphery of the substrate holder, as required by the claims. There is, indeed a gap between confinement ring **222** and the substrate holder. As such, Li et al. clearly ***teaches away*** from the features and configuration of the claimed invention.

Accordingly, Appellant respectfully submits that Li et al. is incapable of teaching each and every feature of the independent claims. Thus, for these reasons, among others, the Appellant respectfully submits that Li et al. cannot be relied upon to anticipate any of the independent claims.

E. Examiner Rejections Based on Ludvickson et al.

Yet again, like all the previous references, Ludvickson et al. fails to suggest any type of device that is either specifically configured to center, or is capable of centering, the baffle plate. Ludvickson et al. discloses a method of using a sensor gas to determine the erosion level of consumable system components in an apparatus having a baffle plate **64** that extends about the periphery of the substrate holder **30** and a focus ring **60** and shield ring **62** coupled to the substrate holder **30**. (Ludvikkson et al.: paragraph [0047].) There is absolutely no discussion or suggestion in Ludvikkson et al. that focus ring **60** and shield ring **62** are capable of any type of centering functionality.

Moreover, as FIG. 1 makes it painfully apparent, baffle plate **64** is attached to the interior wall of the chamber – and ***not*** to the portion of the centering ring that extends radially outside the periphery of the substrate holder, as required by the claims. In fact, FIG. 1 depicts a gap between baffle plate **64** and the substrate holder **30**. As such, like Li et al., Ludvikkson et al. clearly ***teaches away*** from the features and configuration of the claimed invention.

Accordingly, Appellant respectfully submits that Ludvikkson et al. is incapable of teaching each and every feature of the independent claims. Thus, for these reasons, among

others, the Appellant respectfully submits that Ludvikkson et al. cannot be relied upon to anticipate any of the indcpendent claims.

II. CONCLUSION

In conclusion, the Appellant respectfully submits that, based on the reasons advanced above and in the Appeal Brief, the claims under appeal are patentable. Accordingly, the Appellant respectfully requests reversal of all the Examiner's outstanding rejections.

Respectfully submitted,

PILLSBURY WINTHROP SHAW PITTMAN LLP

By _____

E. Rico Hernandez
Reg. No.: 47,641
Tel. No.: (703)770-7788
Fax No.: (703) 770-7901

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ERH
P.O. Box 10500
McLean, VA 22102
(703) 770-7900